Renewable Energy-Energy Efficiency/Air Quality Integration

Jerry Kotas
Senior Environmental Scientist
U.S. Department of Energy
Office of Energy Efficiency & Renewable Energy
Central Regional Office
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Overview

- Why integration of EERE/air quality is important
- How state and federal air quality needs can help advance EERE technologies
- Issues and challenges
- Next steps

Goals & Benefits

- Demonstrate/validate EERE as viable options for states to achieve significant and quantifiable reductions in air emissions
- Achieve multi-sector/multi-pollutant benefits
- Foster more collaboration between EERE & air quality stakeholders

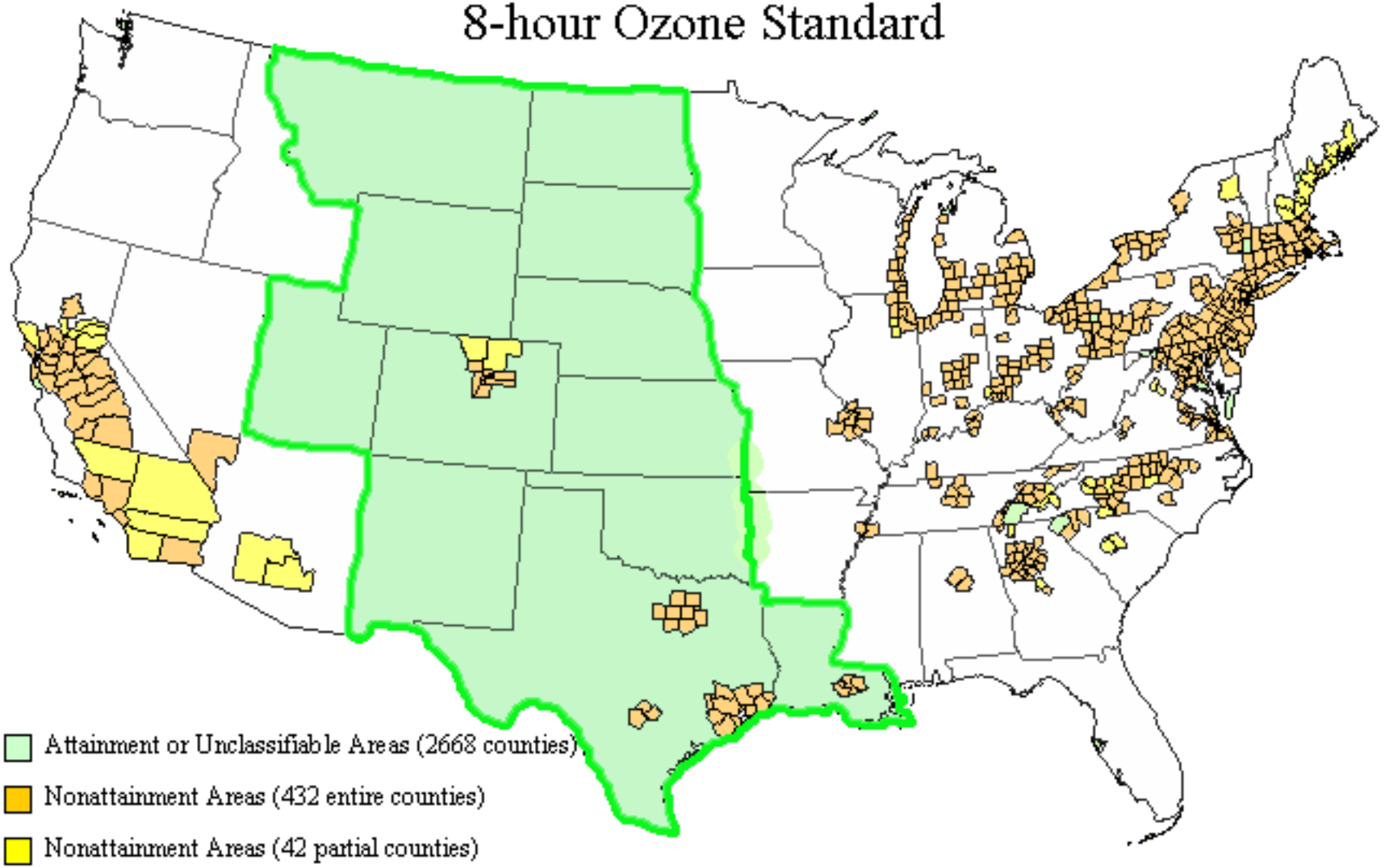
Why Should State Air Quality Officials and EPA Care about EERE?

- **States face multiple challenges**
  - Air Quality/Climate Change
  - Energy/Electricity
  - Economic
- **Focusing only on control technologies misses opportunities to harmonize policies, achieve better results at lower costs**
- **Integration approach furthers environmental, energy and economic goals**

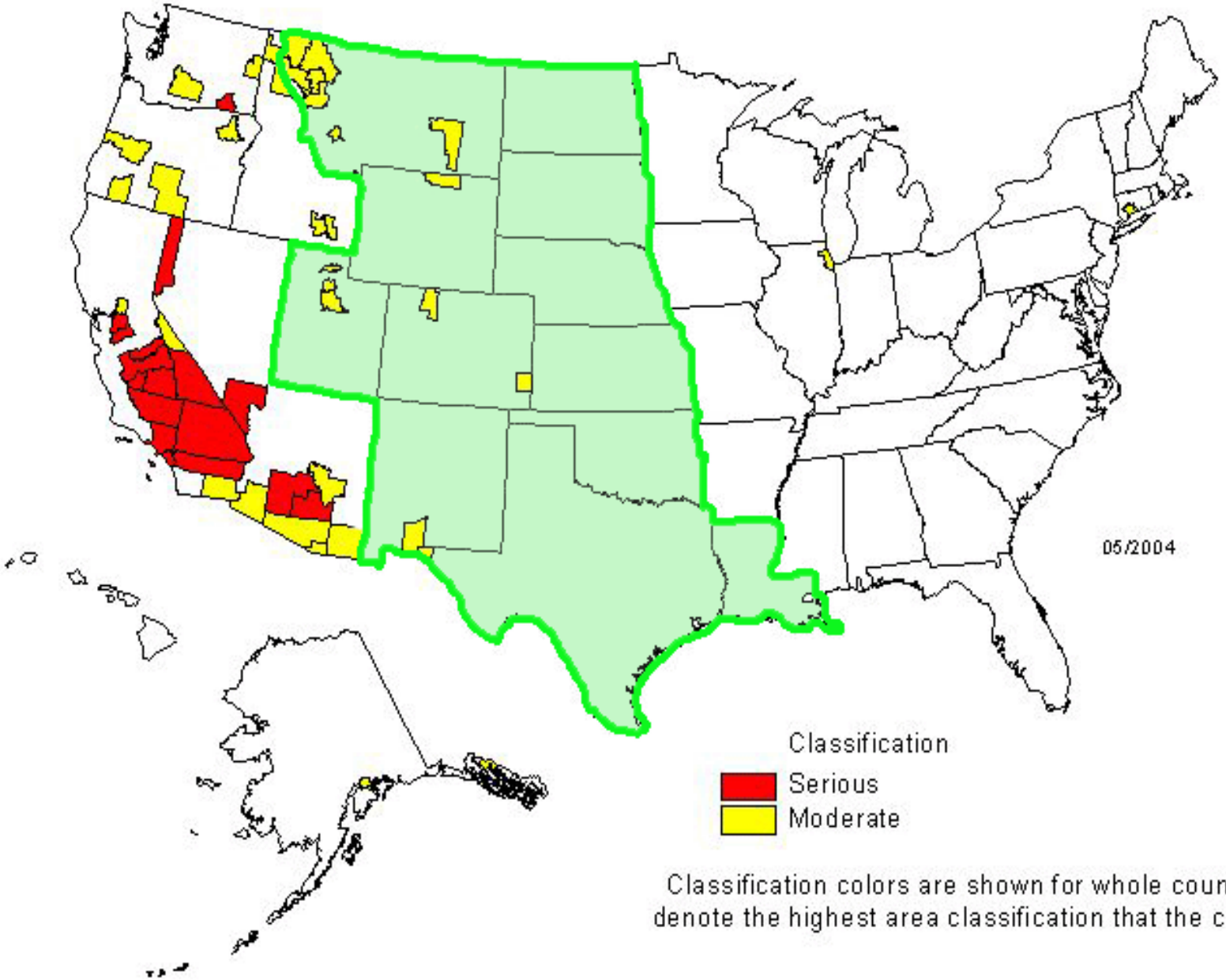
Why Should those working on EERE Care about State and Federal Air Quality Programs

- Opportunity to leverage some of the $19 Billion spent annually on Environmental Compliance
- Demonstrate the quantifiable Win-Win-Win benefits of EERE technologies
- Help get your state air quality folks advocating for EERE projects to help air quality-limited areas of your state

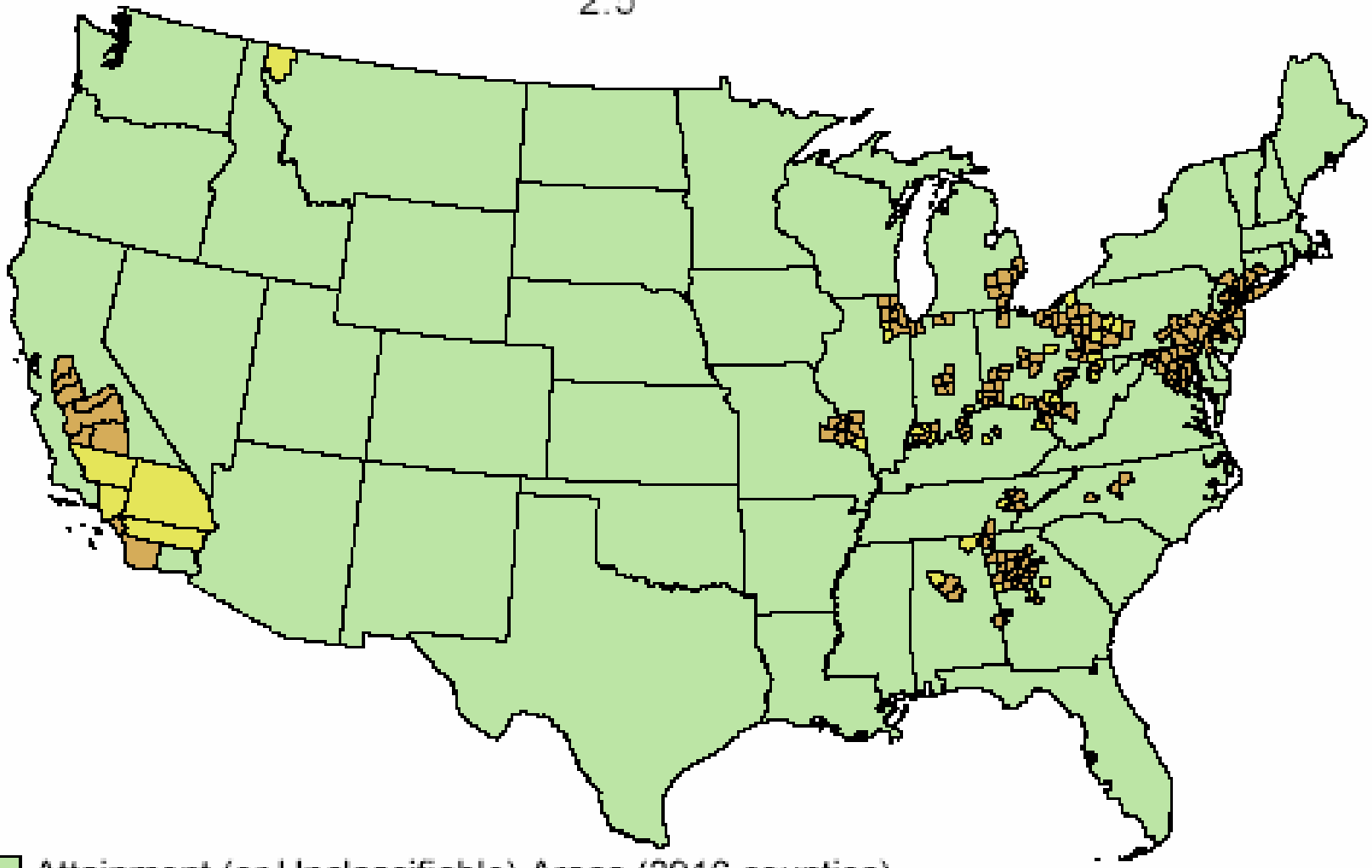
Attainment and Nonattainment Areas in the U.S.
8-hour Ozone Standard



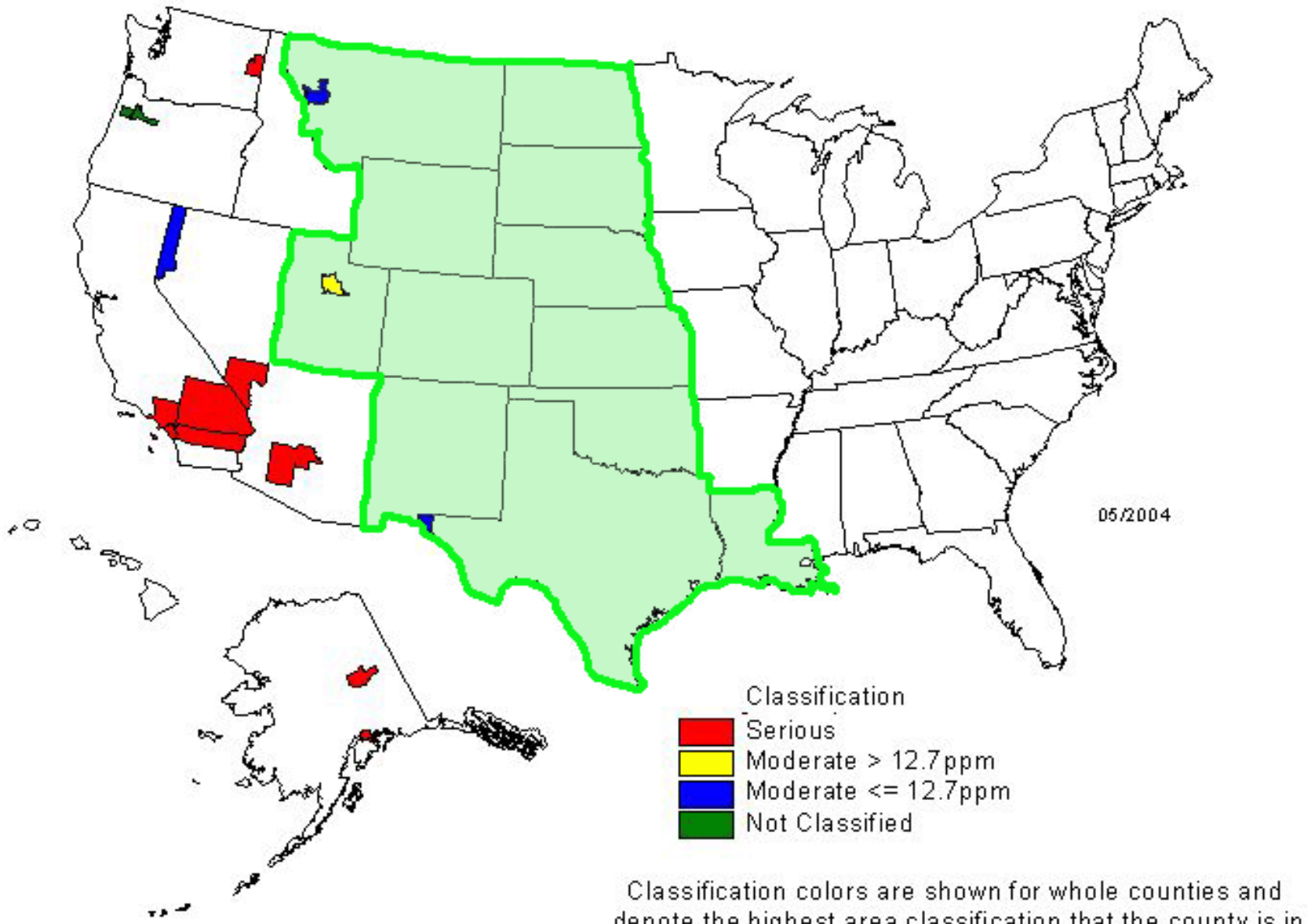
Counties Designated Nonattainment for PM-10



Attainment and Nonattainment Areas in the U.S. $PM_{2.5}$ Standards

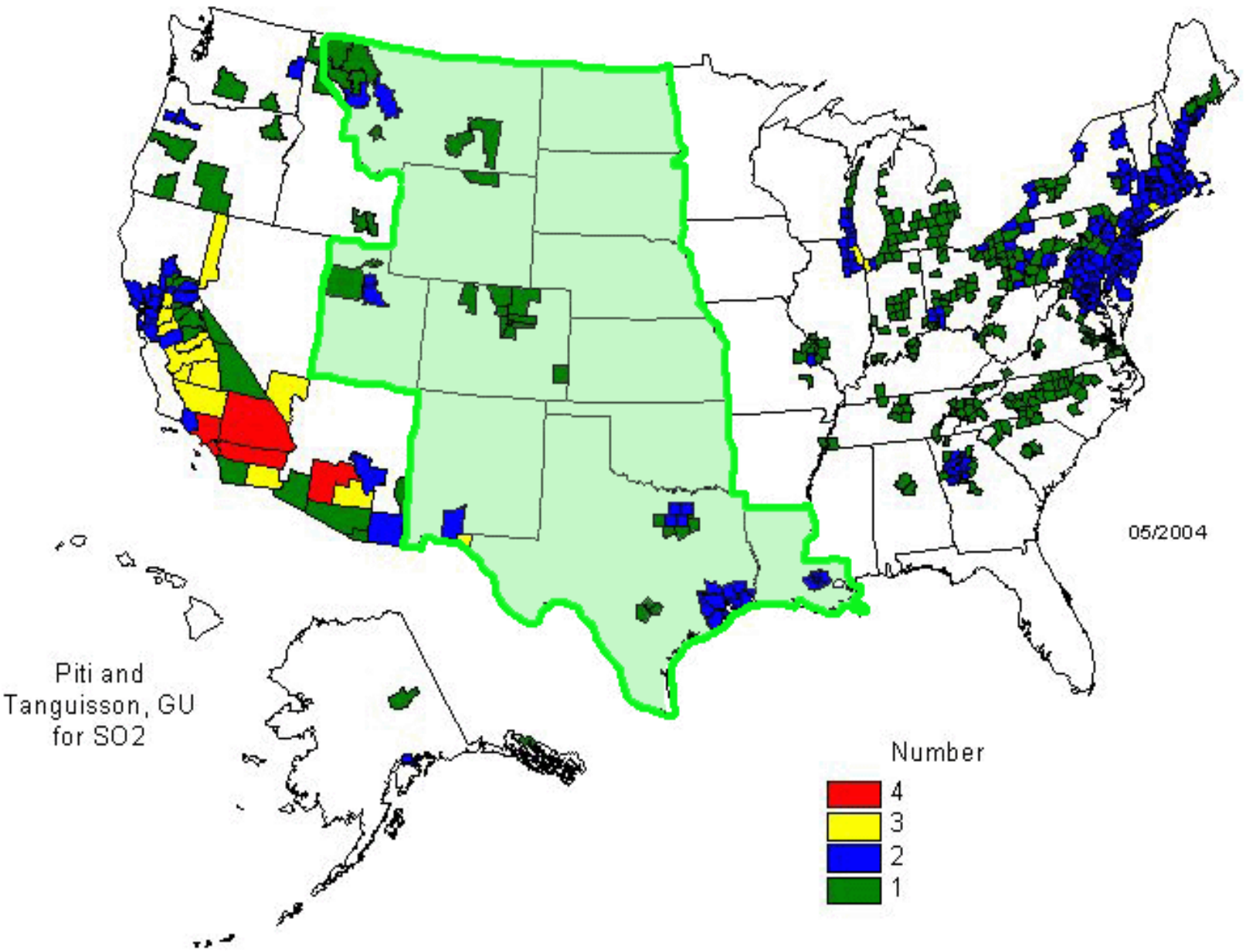


Counties Designated Nonattainment for Carbon Monoxide

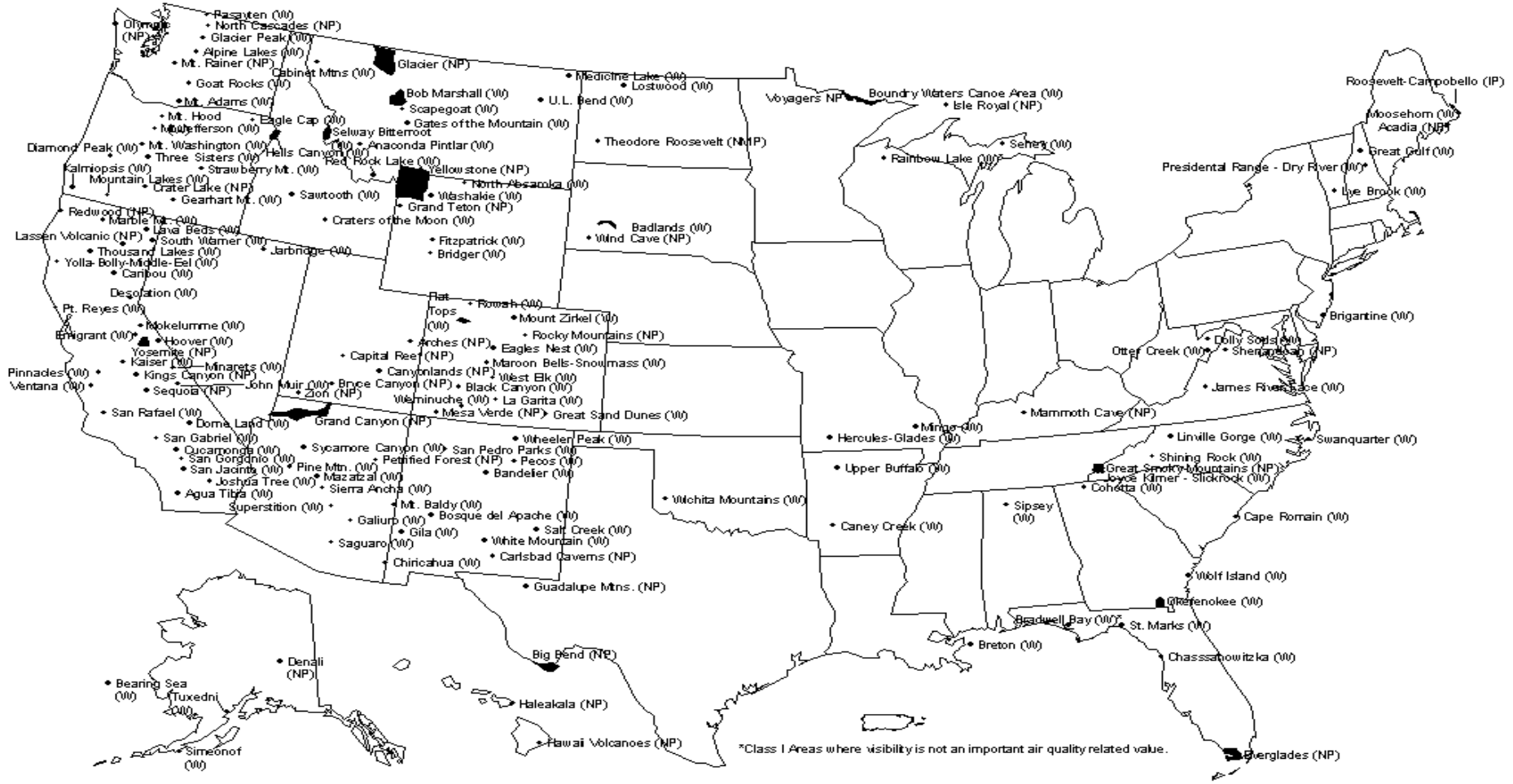


Classification colors are shown for whole counties and denote the highest area classification that the county is in

Number of Pollutants By County Designated Nonattainment



Areas Protected by EPA's Regional Haze Rule



Map of 156 National Park and Wilderness Areas Protected by EPA's Regional Haze Rule

Legend:
NP= National Park
WI = Wilderness
IP = International Park

States Concerned about Climate Change

States See the Connections, Offer Solutions

- From 2004 "State of the State" Addresses:
  - Approximately half of the Governors noted energy/environment/economy connections and proposed related initiatives
  - CA (Schwarzenegger) -- "closely connected to energy is the environment" -- has proposed significant renewable energy and energy efficiency goals for western states (WGA)
  - ME (Baldacci) -- "energy consumption matters both to our environment and our economy" -- noted state purchases of renewable power and adopting green building standards for state buildings

Successful Integration is Happening…

- **NY economic Demand Response program --** energy program that protects AQ **-- prohibits diesel DG use**
- **MD SIP --** AQ program that helps energy goal **-- integrates wind power purchase by county into AQ plan**
- **SEPs -- environmental enforcement settlements that can fund EE/RE projects**
  - **UT –State AQ Division promoting RE SEPs, e.g., utility purchasing 5 years of wind power**
  - **CO –State Environmental agency seeks EERE opportunities in every appropriate enforcement settlement negotiation, e.g., 1st wind SEP in U.S., airport installing energy efficient lighting**

Barriers Still Exist

- **Costs**
  - Upfront and sustained capital
- **Market Imperfections**
  - Internalizing environmental externalities still difficult
- **Institutional Structures**
  - Stove-piped agencies, historical barriers
- **Measurement & Tracking**
  - Quantification & modeling complexities
- **Information & Data**
  - Limited body of data what is working, what is not and why

Range of Measures to Help Advance EERE Technologies

Air Quality

- SIPs
- SEPs
- Allowance Trading/Retirement

- Energy
- System Benefit Funds
- Renewable Portfolio Standards
- Renewable Energy Credits

CLEAN AIR ACT FRAMEWORK

- CAA requires regional air quality plans (State Implementation Plans or SIPs) when an area of the state is in non-attainment of the National Ambient Air Quality Standards

"Window of opportunity"

- –Revised SIPs required by 2006/2007 to meet new 8-hour ozone and PM 2.5 standards
- –August 2004 EPA guidance and NREL model SIP documentation for wind purchases

CAA POLICIES AS MARKET DRIVERS

- State/local governments can choose from wide range of air pollution control measures
- Emission reductions from traditional control measures largely exhausted in dirty air areas
- States and municipalities interested in air quality benefits of EERE technologies
- Lowering NOx emissions results in reduced ozone transport and regional haze

CAA POLICIES AS MARKET DRIVERS

- **Regional air quality plans to meet 8-hour ozone standard in Midwest and East**
  - Marketing window of opportunity in next two years
  - Efficiency, wind, solar, biomass and alt. fuels are important options
  - SIP plans due April 2007
- **Regional air quality plans to meet regional haze regulations in West**

CAA POLICIES AS MARKET DRIVERS

- State and local governments are key markets for EERE technologies
  - Increasing market demand is key for new RE projects
  - RE projects are financed based on the future revenue stream from energy purchases
  - Municipalities and states often serve as important long-term “anchor” customers (Montgomery County, MD; City of Chicago)

MWCOG CASE STUDY

- Metropolitan Washington (MW) area (MD-DC-VA) designated as “severe” ozone non-attainment area under 1-hour standard
- Met. Wash. Council of Governments (MWCOG) submitted revised regional air quality plan (SIP) to EPA Region III in February 2004
- First-ever submission to EPA of wind energy as a control measure
- Measure designed to reduce ozone transport

MWCOG CASE STUDY

- Purchasing group, led by Montgomery County, Maryland, will purchase 5% of their total energy from wind power;
- Purchase is largest U.S. municipal wind purchase – 38,400 Megawatt-hours per year;
- Montgomery County named EPA/DOE Green Power Partner of the year in October 2004
- Energy efficiency planned to offset "green power" premium;
- State of Maryland agrees to retire NOx allowances from renewable energy (RE) set-aside to assure improved air quality

EPA GUIDANCE ON SIP CREDIT FOR EERE

Guidance on SIP Credits for Emission Reductions from Electric-Sector Energy Efficiency and Renewable Energy Measures, issued August 5, 2004

- Sets forth MWCOG wind purchase as its RE example
- Intended to promote the use of EERE technologies to improve air quality
- Requirements for emission reductions:
  - Quantifiable
  - Surplus
  - Enforceable
  - Permanent

- http://www.epa.gov/ttn/oarpg/t1/memoranda/ereseerem_gd.pdf

MODEL SIP DOCUMENTATION FOR WIND PURCHASES

- Prepared by Environmental Resources Trust and partners under contract to NREL
- Model based on MWCOG SIP and subsequent EPA guidance
- Intended to assist State and local governments
- Includes SIP model as well as model RFP and sample methodology

Texas EE activities

- **Senate Bill 7 -- Mandatory Investor Owned Utility Programs**
  - 277,449 MWh savings (annual) ($13 million)
  - $44.7 million net savings over 10 years
  - rough estimate ~ 450 tons NOx reduced (annual)
- Senate Bill 5 -- **Voluntary Grant Programs**
  - municipal goal of 5% energy reduction per year for 5 years
  - 17,752 MWh savings (annual) ($834,000)
  - $2.5 million net savings over 10 years
  - rough estimate ~24 tons NOx reduced (annual)

- **Dallas SIP proposes credit from some of these activities.**
- **Future SIP submissions likely in other air-quality challenged areas**

Regional Haze Rule

- Final regulations issued in July 1999
- Requires states to prepare SIP for regional haze
- Incorporates 1996 recommendations of Grand Canyon Visibility Transport Commission (GCVTC), including 10/20 goals for nine Transport Region states
  - **10% of regional power needs to be met by renewable energy by 2005, 20% by 2015**

EE/RE Opportunities in Supplemental Environmental Projects (SEPs)

Another example of an air quality action that can help fund EE/RE projects

What is a SEP?

- Part of an enforcement settlement
- An environmentally beneficial project with a connection to the violation and the larger air-shed
- Entering into a SEP is voluntary upon violator
- Defendant agrees to invest in an EE/RE community project rather than pay a portion of the fine into the state or EPA general fund
- Not otherwise required to be implemented
- CO first state to negotiate a wind-energy SEP

Renewable Energy SEPs
Wind Power SEP

- $252,800 civil penalty offset by SEP
- 1:1.2 multiplier, $303,000 SEP expenditure
- Premium 2.5 cents per kWh
- Purchase wind power for 5 years
- Utility set up escrow account
- Total kWh 12,134,400 purchased for 5 years
- Build turbine to meet demand for SEP

Wind Power SEP
Environmental Benefits

- Emissions avoided
  - NOx 97 tons per year
  - SO_2 73 tons per year
  - CO_2 3,640 tons per year
- Environmental benefits equivalent to:
  - 4.85 million vehicle miles not traveled per month
  - 1,820 tons coal not burned
  - 1,011 acres trees planted
- Challenges: contract, accounting, logistics
- Project team: Company, NREL, USDOE, Public Service Co. of Colorado, Western Resource Advocates

State and Local Toolkit for EE/RE Opportunities in SEPs

- What's in it?
  - Practical information, guidance, and resources for states to pursue EE/RE through SEPs
  - "How to" project examples, guide to available resources
  - Peer exchange network
  - Will be available on the epa.gov web site in the near future

DOE Pilot Initiative

- DOE & EPA jointly promoting EERE/air quality integration
- Launched Pilot initiative August 04 at regional/state level to get replicable collaborations, commitment of resources and replicable "project activities" established
- Selected four states (or groups of states) in four DOE regions:
  - Central, Midwest, Southeast, MidAtlantic
- Evaluate
- Replicate in other states and regions

- Joint DOE/EPA (EERE) work group

Vision of Success

- **What are we celebrating 1 year from now?**
  - Activity well underway, in a state or group of states in each pilot region, that includes good collaborative relationships in place between air, energy, utility and possibly transportation officials
  - Projects well underway in all 4 Pilot regions which demonstrate "on the ground" results of this new collaboration and partnering
  - Proof of commitment: resources committed
  - EPA favorably inclined to process and expected outcomes
  - Pilot evaluation/lessons learned
  - DOE, EPA, NASEO, ECOS, NARUC, AASHTO, GETF all providing high-level recognition to pilot successes and to build on momentum and on investments to help replicate results in other states/regions using peer to peer exchange and all other means

Vision of Success

- **What are we celebrating 5 years from now?**
  - Paradigm shift for EERE/AQ integration has occurred
  - EE&RE are a *standard* part of AQ and transportation planning and implementation decisions
  - Increased investment in and use of EERE
  - Proof of commitment: states, local gov't, EPA, DOE and all stakeholders bringing resources to the table

Selection Criteria

- High likelihood of success
  - Quantifiable energy & AQ outcomes
  - Commitment of resources
  - New and innovative
  - Replicable
  - Demonstrates tools for verification
  - Help EPA validate guidances which encourage use of EERE or demo new state/regional policies which help leverage investment in EERE for AQ outcomes
- Pilot projects may choose among a range of policy or financial approaches, e.g., SIP credit, RPS, SBFs
- Focus on implementation (short & med. term)
- Involves state/regional air, energy & utility reps

Selecting Pilot States & Projects

- States or regional organizations (e.g. WGA or WRAP) facing air quality challenges
- *Demonstrated* state interest including willingness to commit resources
- Input from EPA, DOE, NASEO, ECOS, GETF, NREL
- DOE regional offices made selections in close collaboration with EPA regional offices
- No direct funding to states available now, but we encourage states to propose projects for next steps and future funding

Georgia Environmental Facilities Authority Pilot Initiative

- Support policies that stimulate investment in EERE driven by quantification of resulting emission reductions & other benefits
  - Policies could include
    - More investment in DSM
    - Tax incentives for EE
    - Portfolio standards for EE/RE
    - Public benefit funds
    - State appliance standards
    - EE/RE set-aside in cap & trade rules

Georgia Environmental Facilities Authority Pilot Initiative Objectives

- Quantify environmental benefits of EERE in future energy planning
- Air Protection Branch looks to EERE as compliance measures for $PM_{2.5}$ and 8-hour Ozone
- Improved collaborations between Energy and Air Quality within the State
- Develop analytic capacity to quantify benefits of energy, environmental and transportation policies

Setting Expectations

- DOE, EPA and partners work with selected pilot states or group of states to develop cutting-edge activities
  - Strategic “roadmaps”
  - Testing new guidance
- Plan to build working relationships and agreements
- Secure commitment of resources
- Identify milestones
- Communicate and reach agreement on expectations (states, DOE & EPA ROs, and HQ)

Technical Assistance Available

- DOE regional offices
  - Info and assistance in using partnership, funding and tech. ass't from EERE programs; short-term assistance from labs (TAP)
- EPA
  - technical forums; info on new guidance; access to voluntary energy-related programs
- NREL
  - help pilot states quantify emission reductions; RE resource evaluation; TA on EERE technology options; info on best practices used in other areas
- GETF
  - Technical assistance and significant experience base to share
- NASEO
  - Help in accessing key partners and other assistance to ROs and states
- ECOS
    - Network and peer-exchange with other states; access to website; help in accessing key partners

Key to Success: How can we work Together?

Questions & Answers

Discussion

For More Information Contact

- **Steve Hortin, DOE Southeast Regional Office, steve.hortin@ee.doe.gov,**
  404-562-0593
- **Jerry Kotas, DOE Central Regional Office**
  Jerry.kotas@ee.doe.gov
  303-275-4850

Carpe Ventem!